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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

05.10.2004

Applicant's or agent's file reference

65823-0515 2316.1910W001

IMPORTANT NOTIFICATION

International application No.

PCT/US 03/28040

International filing date (day/month/year)

08.09.2003

Priority date (day/month/year)

24.09.2002

Applicant

KRONE, INC. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:



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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 65823-0515	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/28040	International filing date (<i>day/month/year</i>) 08.09.2003	Priority date (<i>day/month/year</i>) 24.09.2002
International Patent Classification (IPC) or both national classification and IPC H01B7/02		
Applicant KRONE, INC. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 12.04.2004	Date of completion of this report 05.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Weisser, W Telephone No. +49 89 2399-2613



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/28040**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-16 as originally filed

Claims, Numbers

1-11 as originally filed

12-30 received on 12.11.2003 with letter of 04.11.2003

Drawings, Sheets

1-4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/28040**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

see separate sheet

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 17, 20, 21, 22

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 17, 20, 21, 22 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3,13,15,16,19,25,30
	No: Claims	1,2,4-12,14,18,23,24,26-29
Inventive step (IS)	Yes: Claims	3,13,16,19,25,30
	No: Claims	1,2,4-12,14,15,18,23,24,26-29
Industrial applicability (IA)	Yes: Claims	1-16, 18, 19, 23-30
	No: Claims	-

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

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2. Citations and explanations

see separate sheet

1. In this IPER the following document will be referred to:
D1: US 504 397 A (J. W. MARSH) 5 September 1893 (1893-09-05)

2. Clarity (Art.6 PCT)

In present claims 1, 24, 25 and 26 the term "extending generally along" is not clear, since the expression "generally" leaves the scope of said term unclear. In the following said term is understood as "extending along" (cf. e.g. figures).

The subject matter defined in claim 4 is already defined in claim 1.

In claim 8 it is unclear how the closed-cell gas pockets should be related with the wire and whether closed-cell gas pockets should be present in the wire.

Present claims 17 and 20-22 merely define desired results to be achieved without in clear terms setting out the means necessary for obtaining these results (Guidelines Chapter III, 4.7). Said claims can therefore not be examined with regard to Art.33 PCT.

In present claim 24 the meaning of "extends generally the length of the conductor" is not clear. It appears (cf. present claims 1, 25, 26 and Figs) that the at least one first channel should extend along the length of the conductor.

In present claim 25 the term "twisted pairs" is not clear. It appears that the term relates to wires (i.e. twisted pairs of wires) (cf. e.g. paragr. 0025).

In present claim 26 it is not clear whether the term "including" (in the first line of the claim) should refer to "wire" or to "component". In the following it is considered, that reference is made to "component", since in line 4 of the claim a "channelled component" is defined.

The unit(s) "in" expressed on pages 10 and 14 are not expressed by appropriate SI units (Rule 10a PCT).

The wordings "the entire teaching of these applications being incorporated herein by this reference" (paragr. 0001) and the entire paragr. 0071 imply that the extent of protection may be expanded in some vague and not precisely defined way (Guidelines Chapter III, 4.3a).

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/28040

3. Novelty (Art. 33.2 PCT)

D1 (cf. Figs.1,2,4,9; page 1, left-hand column, line 33- right-hand column, line 71) discloses a wire comprising a conductor (a), an insulation (b), surrounding the conductor, and air channels (2) extending along the longitudinal axis of the conductor, wherein the outer peripheral surface of the conductor forms one side of the channels.

The subject matter of present claims 1, 24 and 26 is therefore not new (Art. 33.2 PCT).

3.1 The subject matter of dependent present claims 2, 4-12, 14, 18, 23, 27-29, as far as they are understood (cf. item 'clarity' above) is also not new with regard to D1, for the following reasons:

- Claims 2, 4-12, 18, 23: apparent from Figs.1,2,4,9; page 1, left-hand column, line 33- right-hand column, line 71
- Claims 14: outer jacket (c)
- Claims 27-29: the channelled insulation (b) is a jacket

3.2 The subject matter of present claims 3, 13, 15, 16, 19, 25 and 30 appears to be novel (Art.33.2 PCT).

4. Inventive step (Art. 33.3 PCT)

It is well known in the art that single wires may be twisted for various reasons. It is thus obvious to the skilled person that also single wires of the type disclosed in D1 may be twisted. The subject matter of present claim 15 therefore appears not to be inventive (Art.33.3 PCT).

4.1 The subject matter of present claims 3, 13, 16, 19, 25 and 30 appears to be inventive (Art. 33.3 PCT).

5. Industrial applicability (Art. 33.4 PCT)

The subject matter of the present set of claims (claims 1-16, 18, 19 and 23-30) appears to be industrially applicable (Art. 33.4 PCT).

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12. The wire of claim 11, wherein no one of the plurality of first channels has a cross-sectional area greater than about 30% of a cross-sectional area of the insulation.
13. The wire of claim 1, wherein the insulation fully surrounds at least one second channel separate from the at least one first channel.
14. The wire of claim 1, further comprising an outer jacket surrounding the insulation.
15. The wire of claim 1, wherein two insulated conductors are twisted together to form a twisted pair.
16. The wire of claim 15, wherein the cross-sectional area of the channel for a first of the twisted pairs is different than the channel for a second of the twisted pairs to reduce delay skew between them.
17. The wire of claim 16, wherein the delay skew is no greater than 15 ns between the insulated conductors.
18. The wire of claim 1, wherein the conductor is solid copper.
19. The wire of claim 1, further comprising a secondary insulation located between the conductor and the insulation, wherein an outer peripheral surface of the secondary insulation forms one side of the at least one first channel.
20. The wire of claim 1, wherein the insulated conductor passes a test selected from the group consisting of NFPA 255, NFPA 259, NFPA 262 or combinations thereof.
21. The wire of claim 1, wherein the insulated conductor generates at least 10% less smoke when burned according to a UL 910 Steiner Tunnel test when compared to an insulated conductor without channels in its insulation.

22. The wire of claim 1, wherein the insulated conductor spreads flame at a rate at least 10% slower when burned according to a UL 910 Steiner Tunnel test when compared to an insulated conductor without channels in its insulation.

23. The wire of claim 1, wherein a shape of the at least one first channel is selected from the group consisting of rectangular, trapezoidal and arched.

24. An insulated conductor comprising:
a conductor having a length; and
an insulation surrounding the conductor and having substantially the same length as the conductor,
wherein the insulation includes at least one first channel that extends generally the length of the conductor and wherein an outer peripheral surface of the conductor forms one side of the at least one first channel, the channel material including a gas in contact with the conductor.

25. A communication wire for transmitting data and other signals including a plurality of twisted pairs comprising:
for each of the twisted pairs a conductor extending along a longitudinal axis, an insulation surrounding the conductor and at least one first channel in the insulation extending generally along the longitudinal axis to form an insulated conductor, wherein an outer peripheral surface of the conductor forms one side of the at least one first channel;
and
wherein the cross-sectional area of the channel for a first of the twisted pairs is different than the channel for a second of the twisted pairs to reduce delay skew between them.

26. A wire comprising a component extending along a longitudinal axis and including at least one first channel extending generally along the longitudinal axis,
wherein the component is selected from a conductor, insulation, a jacket or combinations thereof to form a channeled component containing a gas,

with the proviso that where the channeled component consists of an insulation, an outer peripheral surface of a conductor forms one side of the at least one first channel.

27. The wire of claim 26, wherein the channeled component includes at least a channeled jacket.

28. The wire of claim 27, further comprising a core element extending along the longitudinal axis, wherein the channeled jacket surrounds the core element to form an isolated core.

29. The wire of claim 28, wherein the core element is selected from the group consisting of a copper conductor, a fiber optic conductor, an insulated conductor, a twisted pair, insulation, a shield, a separator and combinations thereof.

30. The wire of claim 28, wherein the core element includes a channeled insulation, a channeled conductor, or combinations thereof.